1,5 ANHYDROGLUCITOL: A BIOMARKER FOR TYPE 1 DIABETES SCREENING


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Diabetes is one of the most common chronic pediatric diseases. Type 1 diabetes (T1D), an autoimmune disease, is the leading form of diabetes among young white people. Fasting glucose and glycated hemoglobin A1C (HbA1C) levels are the standard measures for diabetes diagnosis and monitoring. 1,5-anhydroglucitol (1,5AG), a nontraditional postprandial glycemic control biomarker (1-3 weeks), may also be useful for T1D screening. We studied serum levels of 1,5AG as a potential biomarker for T1D screening in adults and children. After obtaining study approval from the Ethics Committee, we studied 183 patients with T1D and 433 healthy subjects categorized using the 2013 criteria from the American Diabetes Association (ADA). Participants were divided into age-matched subgroups and analyzed separately: (i) adults (19-42 years) with T1D (n=92) and healthy controls (n=84), and (ii) children (8-14 years) with T1D (n=91) and healthy controls (n=249). Serum 1,5AG levels were measured enzymatically using the commercial GlycoMark test (GlycoMark, Inc.), and no patients showed symptoms of overt kidney disease (creatinine <1.1 mg/dL). The median (25%-75% quartiles) 1,5AG levels (µg/mL) for the control and T1D groups in adults and children, respectively, were: (i) 25.5 (21.6-30.9) vs. 3.6 (2.6-5.4), p<0.001 (Mann-Whitney test) and (ii) 28.8 (25.3-34.7) vs. 2.3 (1.5-3.6), p<0.001. Receiver operating characteristic (ROC) curves were used to verify that the biomarker could discriminate T1D. With a cut-off of ≤13.2 µg/mL in adults and ≤8.1 µg/mL in children, 1,5AG was able to discriminate T1D with a sensitivity and specificity of 95.6% and 96.7%, respectively, in both groups. In summary, this prospective study showed the potential usefulness of 1,5AG as a biomarker for T1D screening.

Keywords: T1D, 1,5AG, diabetes screening.
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